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[illegible]


```
1 0001 0 MODULE STR$POS_EXTR (      ! Extract a substring by position
2 0002 0
3 0003 0      IDENT = '1-012' ! File: STRPOSEXT.B32  Edit:  RKR1012
4 0004 0
5 0005 0      ) =
6 0006 1 BEGIN
7 0007 1
8 0008 1 *****
9 0009 1 *
10 0010 1 *  COPYRIGHT (c) 1978, 1980, 1982, 1984 BY
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26 0026 1 *  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.
27 0027 1 *
28 0028 1 *
29 0029 1 *****
30 0030 1
31 0031 1
32 0032 1 ++
33 0033 1 FACILITY: String support library
34 0034 1
35 0035 1 ABSTRACT:
36 0036 1
37 0037 1 This module extracts a substring according to the BASIC-PLUS-2
38 0038 1 syntax. It finds the substring of a main string starting at the
39 0039 1 character position specified by the second input parameter and
40 0040 1 continues for the number of characters specified by the third
41 0041 1 input parameter. This substring is copied to the destination
42 0042 1 string.
43 0043 1
44 0044 1 ENVIRONMENT: User mode, AST level or not or mixed
45 0045 1
46 0046 1 AUTHOR: R. Will, CREATION DATE: 21-Feb-79
47 0047 1
48 0048 1 MODIFIED BY:
49 0049 1
50 0050 1 R. Will, 28-Feb-79: VERSION 01
51 0051 1 1-001 - Original
52 0052 1 1-002 - Change linkage and call to COPY routine. 15-Mar-79 RW
53 0053 1 1-003 - Make the string linkages start with STR$. JBS 04-JUN-1979
54 0054 1 1-004 - Change call to STR$$COPY. JBS 16-JUL-1979
55 0055 1 1-005 - Change name to STR$, string cleanup. RW 1-Nov-79
56 0056 1 1-006 - Correct psect name. JBS 02-NOV-1979
57 0057 1 1-007 - Change to new interlock macros. JBS 06-NOV-1979
```


STR\$POS_EXTR
1-012

F 1
16-Sep-1984 01:44:44
14-Sep-1984 12:40:12

VAX-11 Bliss-32 V4.0-742
[LIBRTL.SRC]STRPOSEXT.B32;1

Page 2
(1)

```

: 58      0058 1 | 1-008 - Use string interlocks in CALL entry. RW 15-Nov-79
: 59      0059 1 | 1-009 - String speedup, remove edit 8. RW 8-Jan-1980
: 60      0060 1 | 1-010 - Enhance routine to recognize additional classes of descriptors
: 61      0061 1 | by using $STR$GET_LEN_ADDR to extract length and address
: 62      0062 1 | of 1st byte of source descriptor. Remove string interlocking
: 63      0063 1 | code. RKR 21-APR-81.
: 64      0064 1 | 1-011 - Speed up code. RKR 7-OCT-1981.
: 65      0065 1 | 1-012 - Use STR$COPY R R8 for copying operation. Use
: 66      0066 1 | $STR$SIGNAL_FATAL instead of $STR$CHECK_STATUS.
: 67      0067 1 | RKR 18-NOV-1981.
: 68      0068 1 | --
: 69      0069 1 |
: 70      0070 1 | <BLF/PAGE>
```



```
72 0071 1 |
73 0072 1 | SWITCHES:
74 0073 1 |
75 0074 1 |
76 0075 1 | SWITCHES ADDRESSING MODE
77 0076 1 | (EXTERNAL = GENERAL, NONEXTERNAL = WORD_RELATIVE);
78 0077 1 |
79 0078 1 |
80 0079 1 | LINKAGES:
81 0080 1 |
82 0081 1 |
83 0082 1 | REQUIRE 'RTLIN:STRLNK'; ! Use require file with string linkage
84 0267 1 |
85 0268 1 |
86 0269 1 | TABLE OF CONTENTS:
87 0270 1 |
88 0271 1 |
89 0272 1 | FORWARD ROUTINE
90 0273 1 | STR$POS_EXTR, ! Find a substr by position, CALL
91 0274 1 | STR$POS_EXTR_R8 : STR$JSB_POS_EXT; ! find a substr by position, JSB
92 0275 1 |
93 0276 1 |
94 0277 1 | INCLUDE FILES:
95 0278 1 |
96 0279 1 |
97 0280 1 | REQUIRE 'RTLIN:RTLPSECT'; ! Declare PSECTs code
98 0375 1 |
99 0376 1 | REQUIRE 'RTLIN:STRMACROS'; ! use string macros to code
100 1292 1 |
101 1293 1 | LIBRARY 'RTLSTARLE'; ! STARLET library for macros and symbol
102 1294 1 |
103 1295 1 |
104 1296 1 | MACROS:
105 1297 1 |
106 1298 1 | NONE
107 1299 1 |
108 1300 1 | EQUATED SYMBOLS:
109 1301 1 |
110 1302 1 | NONE
111 1303 1 |
112 1304 1 | PSECT DECLARATIONS
113 1305 1 |
114 1306 1 |
115 1307 1 | DECLARE_PSECTS (STR);
116 1308 1 |
117 1309 1 |
118 1310 1 | OWN STORAGE:
119 1311 1 |
120 1312 1 | NONE
121 1313 1 |
122 1314 1 | EXTERNAL REFERENCES:
123 1315 1 |
124 1316 1 |
125 1317 1 | EXTERNAL ROUTINE
126 1318 1 | STR$COPY_R_R8 : STR$JSB_COPY_R , ! to do copying
127 1319 1 | LIB$STOP; ! signal fatal errors
128 1320 1 |
```


STR\$POS_EXTR
1-012

H 1
16-Sep-1984 01:44:44
14-Sep-1984 12:40:12

VAX-11 Bliss-32 V4.0-742
[LIBRTL.SRC]STRPOSEXT.B32;1

Page 4
(2)

```
: 129      1321 1 EXTERNAL LITERAL
: 130      1322 1 STR$NORMAL,
: 131      1323 1 STR$_ILLSTR$PE,
: 132      1324 1 STR$_ILLSTRPOS;
```

```
: successful completion
: illegal string specification
: illegal string position
```



```
134 1325 1 GLOBAL ROUTINE STR$POS_EXTR (      ! substring by position
135 1326 1
136 1327 1     DEST_DESC,      ! Pointer to destination descriptor
137 1328 1     SRC_DESC,      ! Pointer to source descriptor
138 1329 1     START_POS,    ! First character to be included
139 1330 1     END_POS      ! Last character position to include
140 1331 1
141 1332 1     ) =
142 1333 1
143 1334 1 ++
144 1335 1 FUNCTIONAL DESCRIPTION:
145 1336 1
146 1337 1     This routine extracts the characters starting at the
147 1338 1     character position in the source string specified by the 3rd
148 1339 1     input parameter and continuing to the character position in the
149 1340 1     source string specified by the 4th input parameter, and copies
150 1341 1     that substring to the destination string (by JSB to
151 1342 1     STR$COPY_R_R8) according to the syntax of the class of the
152 1343 1     destination string.
153 1344 1     If the starting position is < 1, 1 is used. If the ending
154 1345 1     position is > length of the source string, the length of the
155 1346 1     source string is used. If the starting position > the ending
156 1347 1     position, a null string is returned. The call entry point is
157 1348 1     implemented by JSBing to the JSB entry point.
158 1349 1
159 1350 1 FORMAL PARAMETERS:
160 1351 1
161 1352 1     DEST_DESC.wt.dx    pointer to destination string descriptor
162 1353 1     SRC_DESC.rt.dx     pointer to source string descriptor
163 1354 1     START_POS.rl.r     character position in src to start
164 1355 1                     substring
165 1356 1     END_POS.rl.r       character position in src to end
166 1357 1                     substring
167 1358 1
168 1359 1 IMPLICIT INPUTS:
169 1360 1
170 1361 1     NONE
171 1362 1
172 1363 1 IMPLICIT OUTPUTS:
173 1364 1
174 1365 1     NONE
175 1366 1
176 1367 1 COMPLETION CODES:
177 1368 1
178 1369 1     $$$ NORMAL      Success
179 1370 1     STR$_ILLSTRPOS   Character position reference outside of string
180 1371 1     STR$_ILLSTRSPE   End pos < start pos, or length too long
181 1372 1     STR$_NEGSTRLEN   Negative length supplied, 0 used
182 1373 1     STR$_TRU         Truncation occurred in copying to destination
183 1374 1                     (Warning)
184 1375 1
185 1376 1 SIDE EFFECTS:
186 1377 1
187 1378 1     May signal:
188 1379 1     STR$_FATINTERR   Fatal internal error
189 1380 1     STR$_ILLSTRCLA   Illegal (or unsupported) string class
190 1381 1     STR$_INSVIRMEM   Insufficient virtual memory for
```


STR\$POS_EXTR
1-012

J 1
16-Sep-1984 01:44:44
14-Sep-1984 12:40:12

VAX-11 Bliss-32 V4.0-742
[LIBRTL.SRC]STRPOSEXT.B32;1

Page 6
(3)

reallocation of dynamic string

191 1382 1
192 1383 1
193 1384 1
194 1385 1
195 1386 2
196 1387 2
197 1388 2
198 1389 2
199 1390 2
200 1391 2
201 1392 2
202 1393 2
203 1394 2
204 1395 2
205 1396 1

BEGIN

MAP

SRC_DESC : REF \$STR\$DESCRIPTOR,
DEST_DESC : REF \$STR\$DESCRIPTOR;

RETURN STR\$POS_EXTR_R8 (DEST_DESC [0,0,0,0],
SRC_DESC [0,0,0,0],
..START_POS,
..END_POS);

END;

!End of STR\$POS_EXTR

.TITLE STR\$POS_EXTR
.IDENT \1-012\

.EXTRN STR\$COPY_R_R8, LIB\$STOP
.EXTRN STR\$_NORMAL, STR\$_ILLSTRSPE
.EXTRN STR\$_ILLSTRPOS

.PSECT _STR\$CODE,NOWRT, SHR, PIC,2

.ENTRY STR\$POS_EXTR, Save R2,R3,R4,R5,R6,R7,R8
MOVL @END_POS, R3
MOVL @START_POS, R2
MOVQ DEST_DESC, R0
BSBW STR\$POS_EXTR_R8
RET

: 1325
: 1393
:
:
: 1396

53 10 BC D0 00002
52 0C BC D0 00006
50 04 AC 7D 0000A
0000V 30 0000E
04 00011

; Routine Size: 18 bytes, Routine Base: _STR\$CODE + 0000


```
207 1397 1 GLOBAL ROUTINE STR$POS_EXTR_R8 (      ! extract substring by position
208 1398 1
209 1399 1      DEST_DESC,      ! Pointer to destination descriptor
210 1400 1      SRC_DESC,      ! Pointer to source descriptor
211 1401 1      START_POS,      ! First character to be included
212 1402 1      END_POS      ! Last character position to include
213 1403 1
214 1404 1      ) : STR$JSB_POS_EXT =
215 1405 1
216 1406 1  !++
217 1407 1  FUNCTIONAL DESCRIPTION:
218 1408 1
219 1409 1      This routine extracts the characters starting at the
220 1410 1      character position in the source string specified by the 3rd
221 1411 1      input parameter and continuing to the character position in the
222 1412 1      source string specified by the 4th input parameter, and copies
223 1413 1      that substring to the destination string (by JSB to
224 1414 1      STR$COPY_R_R8) according to the syntax of the class of the
225 1415 1      destination string.
226 1416 1      If the starting position is < 1, 1 is used. If the ending
227 1417 1      position is > length of the source string, the length of the
228 1418 1      source string is used. If the starting position > the ending
229 1419 1      position, a null string is returned.
230 1420 1
231 1421 1  FORMAL PARAMETERS:
232 1422 1
233 1423 1      DEST_DESC.wt.dx      pointer to destination string descriptor
234 1424 1      SRC_DESC.rt.dx      pointer to source string descriptor
235 1425 1      START_POS.rl.v    character position in src to start
236 1426 1                      substring
237 1427 1      END_POS.rl.v        character position in src to end
238 1428 1                      substring
239 1429 1
240 1430 1  IMPLICIT INPUTS:
241 1431 1
242 1432 1      NONE
243 1433 1
244 1434 1  IMPLICIT OUTPUTS:
245 1435 1
246 1436 1      NONE
247 1437 1
248 1438 1  COMPLETION CODES:
249 1439 1
250 1440 1      SSS_NORMAL          Success
251 1441 1      STR$_ILLSTRPOS    Character position reference outside of string
252 1442 1      STR$_ILLSTRSPE    End pos < start pos, or length too long
253 1443 1      STR$_NEGSTRLEN    Negative length supplied, 0 used
254 1444 1      STR$_TRU          Truncation occurred in copying to destination
255 1445 1                      (Warning)
256 1446 1
257 1447 1  SIDE EFFECTS:
258 1448 1
259 1449 1      May signal:
260 1450 1      STR$_FATINTERR      Fatal internal error
261 1451 1      STR$_ILLSTRCLA     Illegal (or unsupported) string class
262 1452 1      STR$_INSVIRMEM     Insufficient virtual memory for
263 1453 1                      reallocation of dynamic string
```



```
264 1454 1 1 1--
265 1455 1 1 1--
266 1456 1 1 1--
267 1457 2 BEGIN
268 1458 2
269 1459 2 LOCAL
270 1460 2 IN_LEN, ! length of source string
271 1461 2 IN_ADDR, ! addr of 1st byte of source
272 1462 2 ACTUAL_START, ! MAX (1, .START_POS)
273 1463 2 LENGTH, ! length to copy
274 1464 2 COPY_STATUS, ! status returned by copy
275 1465 2 RETURN_STATUS; ! save status for this routine
276 1466 2
277 1467 2 MAP
278 1468 2 SRC_DESC : REF $STR$DESCRIPTOR,
279 1469 2 DEST_DESC : REF $STR$DESCRIPTOR;
280 1470 2
281 1471 2 RETURN_STATUS = 1 ; ! Assume success to follow
282 1472 2
283 1473 2 !+
284 1474 2 Extract length and address of 1st byte of source string.
285 1475 2 !-
286 1476 2 $STR$GET_LEN_ADDR ( SRC_DESC, IN_LEN, IN_ADDR ) ;
287 1477 2
288 1478 2 ACTUAL_START = .START_POS;
289 1479 2
290 1480 2 !+
291 1481 2 length is >=0 and the smaller of the
292 1482 2 (input end_pos and src len) - start pos (must be >0) + 1
293 1483 2 !-
294 1484 2 LENGTH = 1 + ! length = end - start + 1
295 1485 2 BEGIN
296 1486 2 IF .IN_LEN LSS .END_POS
297 1487 2 THEN
298 1488 2 BEGIN
299 1489 2 RETURN_STATUS = STR$_ILLSTRPOS; ! END_POS is too large
300 1490 2
301 1491 2 .IN_LEN ! use srclen, remember
302 1492 2 ! error
303 1493 2 END
304 1494 2 ELSE
305 1495 2 .END_POS ! use specified
306 1496 2 END
307 1497 2
308 1498 2 -
309 1499 2
310 1500 2 BEGIN
311 1501 2 IF .START_POS LSS 1
312 1502 2 THEN
313 1503 2 BEGIN
314 1504 2 RETURN_STATUS = STR$_ILLSTRPOS; ! START_POS is too small
315 1505 2 ACTUAL_START = 1; ! use 1, remember error
316 1506 2 1
317 1507 2 END
318 1508 2 ELSE
319 1509 2 .START_POS ! use specified
320 1510 2 END;
```



```

321 1511 2
322 1512 2
323 1513 2
324 1514 2
325 1515 2
326 1516 2
327 1517 2
328 1518 2
329 1519 2
330 1520 2
331 1521 2
332 1522 2
333 1523 2
334 1524 2
335 1525 2
336 1526 2
337 1527 2
338 1528 2
339 1529 2
340 1530 2
341 1531 2
342 1532 2
343 1533 2
344 1534 2
345 1535 2
346 1536 2
347 1537 1

IF .LENGTH LSS 0 THEN
    BEGIN
        LENGTH = 0;
        RETURN_STATUS = STR$_ILLSTRSPE;
    END;

! START_POS > END_POS
! null string, remember
! error

!+
Copy to destination descriptor for length as computed above.
Input pointer is the sum - 1 of the source pointer and input
start position ( which must be > 0).

COPY_STATUS =
    STR$COPY_R_R8 ( .DEST_DESC, .LENGTH,
        CH$PLOS (.IN_ADDR, .ACTUAL_START - 1) );

IF .COPY_STATUS NEQ SS$ NORMAL
THEN RETURN_STATUS = .COPY_STATUS;

! copy truncated,
! return truncate
! instead of previous
! status

$STR$SIGNAL_FATAL (RETURN_STATUS);
RETURN .RETURN_STATUS;

! signal fatal errors
!End of STR$POS_EXTR_R8
```

```

.EXTRN STR$ANALYZE_SDESC_R1

56 50 D0 00000 STR$POS_EXTR_R8::
02 03 01 DD 00003 MOVL R0, R6
09 1A 00009 PUSHL #1
61 3C 0000B CMPB 3(SRC_DESC), #2
A1 D0 0000E BGTRU 1$
0C 11 00012 MOVZWL (SRC_DESC), IN_LEN
51 D0 00014 MOVL 4(SRC_DESC), IN_ADDR
00 16 00017 BRB 2$
51 D0 0001D MOVL SRC_DESC, R0
52 D0 00020 JSB STR$ANALYZE_SDESC_R1
50 D1 00023 MOVL R1, R5
09 18 00026 MOVL START_POS, ACTUAL_START
8F D0 00028 CMPL IN_LEN, END_POS
03 11 0002F BGEQ 3$
53 D0 00031 MOVL #STR$_ILLSTRPOS, RETURN_STATUS
52 D5 00034 BRB 4$
0D 14 00036 MOVL END_POS, R0
8F D0 00038 TSTL START_POS
01 D0 0003F BGTR 5$
01 D0 00042 MOVL #STR$_ILLSTRPOS, RETURN_STATUS
52 C2 00045 MOVL #1, ACTUAL_START
A0 9E 00048 MOVL #1, R2
09 18 0004C SUBL2 R2, R0
MOVAB 1(R0), LENGTH
BGEQ 6$

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1471
1476
1478
1486
1489
1491
1495
1501
1504
1505
1503
1500
1498
1512
```


STR\$POS_EXTR
1-012

N 1
16-Sep-1984 01:44:44 VAX-11 Bliss-32 V4.0-742
14-Sep-1984 12:40:12 [LIBRTL.SRC]STRPOSEXT.B32;1

Page 10
(4)

			51	D4 0004E	CLRL	LENGTH	: 1514
	6E	00000000G	8F	D0 00050	MOVL	#STR\$ ILLSTRSPE, RETURN_STATUS	: 1515
	52	FF A445	9E	00057 6\$:	MOVAB	-1(ACTUAL_START)[IN_ADDR], R2	: 1527
	50		56	D0 0005C	MOVL	DEST_DESC, R0	
		00000000G	00	16 0005F	JSB	STR\$COPY_R R8	
	01		50	D1 00065	CMPL	COPY_STATUS, #1	: 1529
			03	13 00068	BEQL	7\$	
	6E		50	D0 0006A	MOVL	COPY_STATUS, RETURN_STATUS	: 1530
04	10		6E	E8 0006D 7\$:	BLBS	RETURN_STATUS, 8\$	: 1535
	03		00	ED 00070	CMPZV	#0, #3, RETURN_STATUS, #4	
			09	12 00075	BNEQ	8\$	
			6E	DD 00077	PUSHL	RETURN_STATUS	
		00000000G	00	01 FB 00079	CALLS	#1, LIB\$STOP	
			50	8E D0 00080 8\$:	MOVL	RETURN_STATUS, R0	: 1536
				05 00083	RSB		: 1537

; Routine Size: 132 bytes, Routine Base: _STR\$CODE + 0012

:	348	1538	1		
:	349	1539	1	END	!End of module
:	350	1540	1		
:	351	1541	0	ELUDOM	

PSECT SUMMARY

Name	Bytes	Attributes
_STR\$CODE	150	NOVEC, NOWRT, RD, EXE, SHR, LCL, REL, CON, PIC, ALIGN(2)

Library Statistics

File	----- Total	Symbols Loaded	----- Percent	Pages Mapped	Processing Time
_\$255\$DUA28:[SYSLIB]STARLET.L32;1	9776	7	0	581	00:00.7

COMMAND QUALIFIERS

BLISS/CHECK=(FIELD, INITIAL, OPTIMIZE)/NOTRACE/LIS=LIS\$:STRPOSEXT/OBJ=OBJ\$:STRPOSEXT MSRC\$:STRPOSEXT/UPDATE=(ENH\$:STRPOSEXT)

; Size: 150 code + 0 data bytes

STR\$POS_EXTR
1-012

^{B 2}
16-Sep-1984 01:44:44

VAX-11 Bliss-32 V4.0-742

Page 11

; Run Time: 00:06.1
; Elapsed Time: 00:31.3
; Lines/CPU Min: 15257
; Lexemes/CPU-Min: 32683
; Memory Used: 87 pages
; Compilation Complete

0215 AH-BT13A-SE
VAX/VMS V4.0

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